anatomic™ seat

Recumbent Bike Seat Plans

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Version 1.1

atom™ bikes

anATOMic Seat Introduction

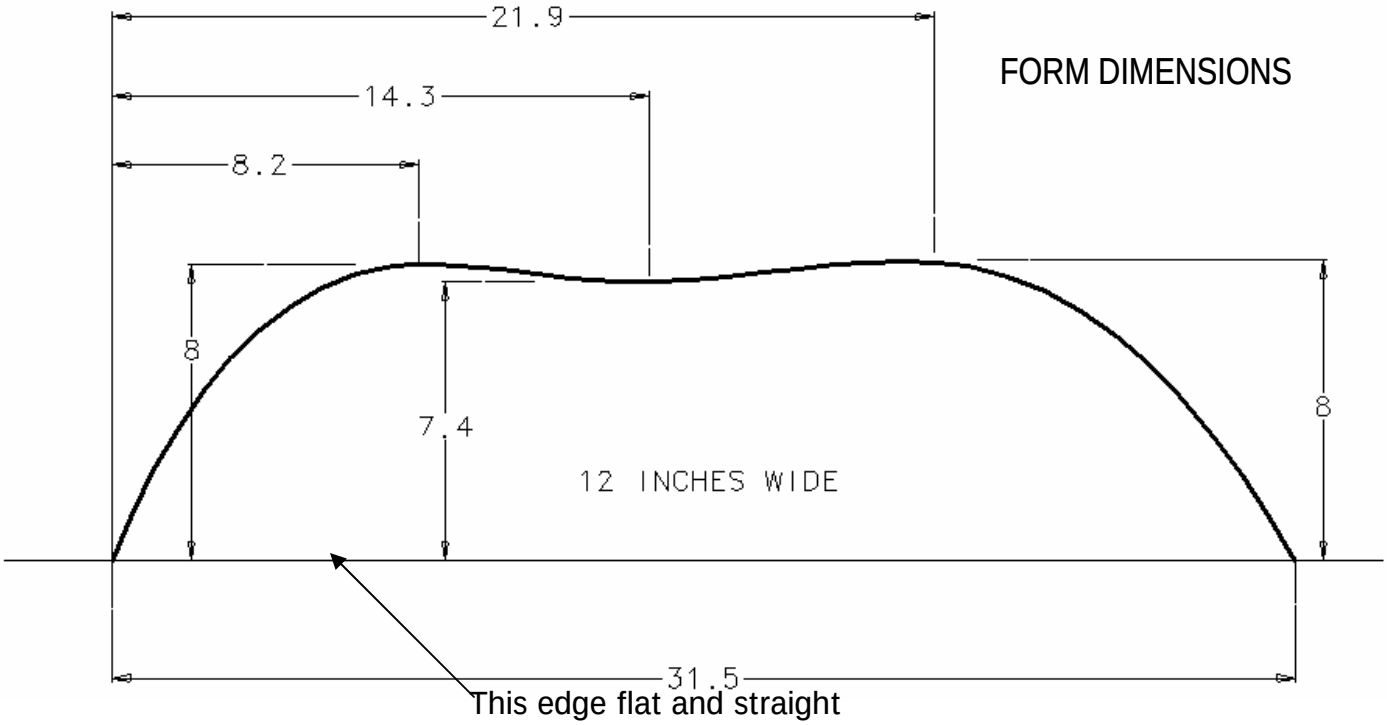
This set of plans describes how to fabricate the anATOMic wood recumbent seat. The anatomic seat is the preferred seat by many homebuilders due to low cost and design flexibility, coupled with extreme power transfer and comfort.

The material you choose to make your seat can be varied, but I recommend using ¼" thick birch plywood. Do NOT use an exterior grade plywood; these have waterproof glues that are impossible to bend without snapping!

The form used to bend the plywood veneers is constructed simply out of ½" thick plywood. Generally, the process is as follows: Cut out the form shape, transfer that multiple times, and then brace to create the form.

Make the Seat Form

A) Using the drawing dimensions as a guide, transfer those measurements onto a large piece of paper or cardboard. You can freeform the shape in between the dimensioned points to get a good contour. Ensure that the edge opposite the contour is flat and straight. Cut out the shape, and trace onto a piece of ½" plywood or pressboard. Cut this shape out with a jigsaw, and then use this piece as a template to cut out 2 more of the same shape.



Fabricating the anATOMic Seat and Mounts

B) Join the 3 shapes together to make one seat form, using sections of 1"X2" in between each shape. Cut the 1"X2"s to length so that the final width of the form is the exact width you would like your seat to be. Make sure this whole form assembly is square. See picture. Note the homemade clamps.

C) Take a 1/4" thick piece of plywood, and cut into a piece 10" wide and 40" long. Cut 2 pieces for the seat.

D) Soak the wood in hot water to make the wood more flexible. Soak times vary from ½ hour to a day or more depending on the wood used. The wood will not seem more pliable, but the soaking process will keep the wood from snapping in the form. Do not soak too long; this will cause the surface to swell. Remove wood from soaking tub and clamp in form. You may need to leave the wet wood clamped in the form for a day or two to allow to dry. Remove wood.

E) Liberally apply wood glue between the two pieces and laminate together.

Fabricating the anATOMic Seat and Mounts

F) Place the laminated wood onto the form, and clamp the centermost clamp. Then work around the contour, clamping as needed to keep the shape uniformly pressed against the form.

G) Let dry for a day or two before removing the clamps.

H) To complete the seat fabrication, radius both ends of the seat to whatever shape you like. You may decide to remove some length from both the top and/or bottom of the seat. Remember, the bottom of the seat has a slightly tighter radius. Bolt on the seat bracket hardware, and fit the seat to the frame.

I) Gently sand all exposed edges and surfaces, and then either paint with an outdoor grade paint or polyurethane the seat for UV protection. A Stanley Surform (cheese grater) file works well to shape the edges of the seat. Take a piece of "filter foam" approx. 1-2 inches thick, and cut to the contour of the seat. Camping mat also works well as a pad, and does not absorb water. Secure the filter foam to the seat with Velcro strips.

Fabricating the anATOMic Seat and Mounts

Make the Seat Mounts

Front Seat Mount

This mount is a “tee” shaped section of donor bike frame. The actual angle of the tee doesn’t matter much, what does matter are the sizes of the tubes. The saddle portion of the tee must be a 1-1/8” tube, so that it will have the appropriate Inside Diameter to correctly sit on top of the Top Tube, and the other tube must be the correct size to accept a seatpost. Refer to the picture to see the frame that I obtained this donor tee from.

Step 9- Fabricate the Seat and Mounts (continued)

Cut the saddle portion of the tee along it's length, right in the middle as shown. Next, cut a 1-1/2" slot in the remaining tube to allow it to properly clamp the seat tube.

Take a spare seat post tube, and measure 4" from the top (the reduced end). Cut at this mark squarely. Insert this cut seat post tube into the top of the saddle to check fit. Secure with either a BMX style seat post clamp or a hose clamp. Slide the salvaged seat frame over the cut seat post and loosely (hand) tighten. You will need to move the seat frame around to determine the best position to mate with the frame in following steps.

Step 9- Fabricate the Seat and Mounts (continued)

Rear Seat Mount

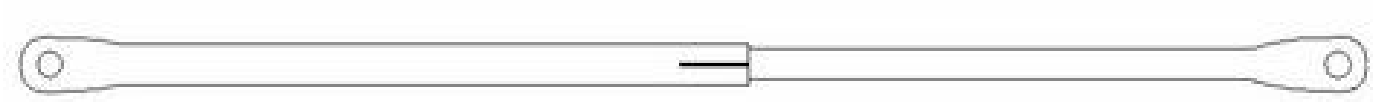
The rear seat mounts are an assembly of aluminum and/or steel struts that bolt to the rear fender mount eyelets at the bottom (the ones on the rear dropouts). At the top they mount to custom fabricated or purchased angle brackets. The angle brackets that mount to the seat are McMaster PN 1556A26, or use the dimensions from that part to make your own.

The seat struts can either be adjustable or a one piece "speed strut". To make speed struts, do the following: after mounting the front seat mount and installing the seat on the front seat mount, simply cut two sections of .375" OD aluminum tubing to the proper length, flatten both ends in the same plane, and secure at the top to the Rear Seat mount angle brackets and at the bottom to the fender eyelets. Alternatively, you could make these out of old ski poles or similar.

If you choose to make adjustable struts (a good idea™ since you don't know the best angle for your seat yet) here's a detail of how to do it. Each strut consists of a 16" to 24" long section of 3/8" OD aluminum tubing that is sleeved inside of a ½" OD X .058" THK (ID is .384") piece of steel tubing, cut to 12" long. To clamp the outer steel tube to the inner aluminum tube, you will cut a 1" long slit in one end of a steel tube. A 1/8" diameter drilled hole at the end of the slit makes for a clean appearance and offers stress relief.

After cleaning the slit free of burrs, insert the aluminum tube into the steel tube, and clamp using a small stainless steel hose clamp. Flatten both ends of this assembly with a vise or hammer. Drill 1/8" holes in both ends of both assemblies. File round all edges. The completed assembly should look like the following pictures.

Step 9- Fabricate the Seat and Mounts (continued)



Step 9- Fabricate the Seat and Mounts (continued)

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Now lay the Front Seat Mount on the bottom side of the anATOMic seat. Mark a line directly down the center (length-wise) on the bottom side of the seat.

Note that you will probably have to make angular adjustments so that the seat frame lies flush with the bottom surface of the wood seat. Do so now and tighten fasteners. You may also find that the front seat mount requires that a portion of the seat mount frame be bent so that all four mount holes are against the seat bottom. It's OK to bend these up to meet the bottom of the seat.

Center the Seat Mount Frame on the Seat bottom. Mark the mounting holes and drill the wood seat. Secure the wood seat to the Front Seat Frame using appropriate fasteners (remember to keep the ones from the donor seat- they work great, are usually the correct length, and most have flat heads).

Step 9- Fabricate the Seat and Mounts (continued)

After you have located, marked and drilled the locations of both the front and rear seat mounts, remove the mounts and prepare to trim the seat. This is done mostly by eye and personal preference, but generally, when looking from the side, the seat edges should not interfere with either the backsides of your thighs or your shoulder/neck area when in a normal riding position.

Create a template by drawing a 10" diameter circle on a piece of cardboard and cut out. Transfer this to both the leading and trailing edges of the seat and then cut with a jigsaw. It is helpful to NOT have the orbital setting turned on, if your jigsaw has that function. After cutting, form/round the edges with a file/surform/sandpaper, then seal with either polyurethane or paint. Reinstall mounts and check fit, making adjustments as necessary.